

PART TWO: CREATING PUBLIC WORKS, 1900–1970

The steamboat dominated the upper Mississippi in the 19th century. First came the river packets and the glorious age of the sternwheelers. During the Civil War eastern railroad terminals along the river became centers for grain shipments. After the Civil War the north-south traffic on the river decreased, and the main channel was taken over by the lumber industry. By the end of the century, log transportation was recognized as a form of commercial navigation. During this period the Corps of Engineers concentrated on improving navigation and providing a clear channel for riverboats.

The 20th century witnessed a gradual change in this single-minded approach to river management. After the last log drives in 1905, the river ceased to be a major link in the nation's transportation system. Between 1905 and 1940 the Mississippi became a recreational resource. Excursion boats plied the water between scenic wonders, and hunting and fishing dominated the backwaters and sloughs of the upper Mississippi. As a result, a large section of the upper Mississippi was designated as a wildlife refuge.

During the 1930s a renewed interest in navigation spurred the building of a nine-foot channel and the construction of 26 locks and dams on the upper Mississippi River. Just as the Illinois and Mississippi Canal (Hennepin) that preceded it (1892–1911), the nine-foot channel was a public works solution to navigational needs. But, by the 1940s the Corps was involved in many water-related problems other than navigation. The Corps also focused on flood control, water supply, water quality, and recreational use of the Mississippi watershed. For the most part, the Corps dealt with these new concerns by constructing public works such as dams, floodwalls, small boat harbors, diversion channels, public access roads, and recreational parks. Public works as the major design approach to water management began at the turn of the century and ended in the 1960s. The following five chapters describe some of the environmental changes that occurred during this phase of Corps history.

V

RECREATIONAL WATERS: THE POLLUTED CHANNEL

During the past two decades the environmental movement won strong support in Wisconsin and Minnesota. The conservation of natural resources along the upper Mississippi, however, began in Iowa. The center of concern for the preservation of wildlife and scenic beauty along the river was the small town of McGregor, Iowa. McGregor, which is across the river from Prairie du Chien, Wisconsin, is located on a stretch of the Mississippi that has always been known for its outstanding scenic and recreational qualities. In the summer of 1919 McGregor became the home of the American School of Wild Life, out of which evolved the national support that eventually created the Upper Mississippi River Wildlife and Fish Refuge. This area, with approximately 300,000 acres set aside for recreational use, is one of the largest national tracts of land providing a habitat for birds, animals, flowers, plants, and aquatic life.¹

A tradition of environmental conservation provided the background for this action. In 1876, under the direction of Fish Commissioner B.F. Shaw, Iowa began to rescue fish that had been trapped in the flooded backwaters of the Mississippi. The rescue mission was so successful that Missouri, Illinois, and Wisconsin soon established their own operations. By the 1920s about 150 million fish a year were being saved. One-half of this total was put back into the Mississippi and the rest was stocked in other lakes and streams.

Conservationists and sportsmen were not the only individuals interested in the backwater areas, however. Developers planned to reclaim the rich bottom lands to increase agricultural production. Senator William S. Kenyon and Representative Gilbert Haugen, both of Iowa, tried to stop floodplain development by planning a national park for the Iowa and Wisconsin sides of the river at McGregor. Congress voted against their proposal. National parks were carved from federal lands, not through the purchase of private property. The Kenyon-Haugen bill, which was introduced in 1916, 1917, 1921, 1923, and 1924, never seriously challenged the established policy of national park development.

During this period, George Bennett of McGregor, a retired Episcopal minister, and Edgar R. Harlan, the Curator of the Iowa Department of History and Archives, formed the Wild Life School. They invited Iowa college professors



Part of the Upper Mississippi River Wildlife and Fish Refuge near Lansing, Iowa.

St. Paul District

to lecture on botany, zoology, ornithology, entomology, geology, forestry, and other subjects related to the environmental development of the upper Mississippi watershed.² Will H. Dilig, the president and co-founder of the Izaak Walton League, attended one of their conferences in 1923. Dilig formulated a plan to ask Congress for a wildlife refuge with the idea of later having the area declared a national park. He wished to block reclamation plans by creating a 250,000-federal-acre site that would provide a flyway for migrating waterfowl and ample water for the protection of the "native American" black bass.³ Dilig asked Congressman Harry B. Hawes of Missouri to introduce a refuge bill that would authorize \$3 million for wetlands between Rock Island, Illinois, and Wabasha, Minnesota. The original draft forbade all public and private improvements in the area, including cultivation of crops. When the bill was referred to the Secretary of War for his opinion, he proposed that a new section be added with the following words:

Nothing in this act shall be construed as exempting any portion of the Mississippi River from the provisions of federal laws for the improvement, preservation, and protection of navigable waters, nor as authorizing any interference with the operations of the War Department in carrying out any project now or hereafter adopted for the improvement of said river.

The major interests of the Corps of Engineers were thus protected.⁴

Hearings on the refuge bill were conducted by Gilbert Haugen (R-Iowa), who chaired the House Agriculture Committee. Many people interested in wildlife, conservation, fishing, hunting, and scenic beauty testified. Other towns along the river sent memorials to their congressmen. A resolution, for example, was sent from River Falls, Wisconsin, deploring the fact that Congress might adjourn before considering the refuge bill. On 7 June 1924, Congress authorized the Secretary of Agriculture to acquire land subject to overflow from Rock Island to Wabasha on either side of the Mississippi. Land could be purchased only with the approval of the appropriate state legislature. Congress set aside \$1,500,000 for the purchase of the refuge lands, and placed a maximum price per acre at \$5.⁵ Twice the Department of Agriculture asked Congress for additional funds and a higher price per acre to purchase the many different parcels of land. Each time the federal government was criticized for taking property to give rich sportsmen a paradise in which to hunt and fish. In spite of the wishes of local landowners and private sports clubs, Congress supplied the additional funds to develop a national wildlife refuge.

But the acquisition of land for wildlife was only part of the problem. The water that flowed through this property was the main sewer for most of the towns and villages along the upper Mississippi. Many citizens thought treating these wastes was unnecessary. Most theorized that the river would adequately purify any material dumped into it, a notion seriously challenged in the 1920s. Patrick Brunet's thesis discussed at least nine federal studies of pollution that were conducted between 1922 and 1934.⁶

The increasing amounts of industrial wastes were the most severe problem. Chief of Engineers Lansing Beach stated in 1924 that the "theory of a stream purifying itself arose before the industrial development of the country had reached the point where it now stands, and when the material deposited in the streams was domestic waste." The dumping of oil into U.S. waterways particularly troubled many people, as oil was a potential fire hazard and destroyed fish and animal life.⁷ The legislation of 1899 failed to deal with the problem, because it was difficult to prove that oil would impede or obstruct navigation. The 1924 Oil Pollution Act prohibited the discharge of oil into coastal navigable waters. Yet the law prohibited dumping petroleum only from oil-burning or oil-carrying vessels; oil could still be emptied into the water from shorelines. Soon after the passage of the oil act, a bill was introduced in Congress to prevent oil pollution in nontidal navigable rivers and nonnavigable rivers, but it failed to pass.⁸

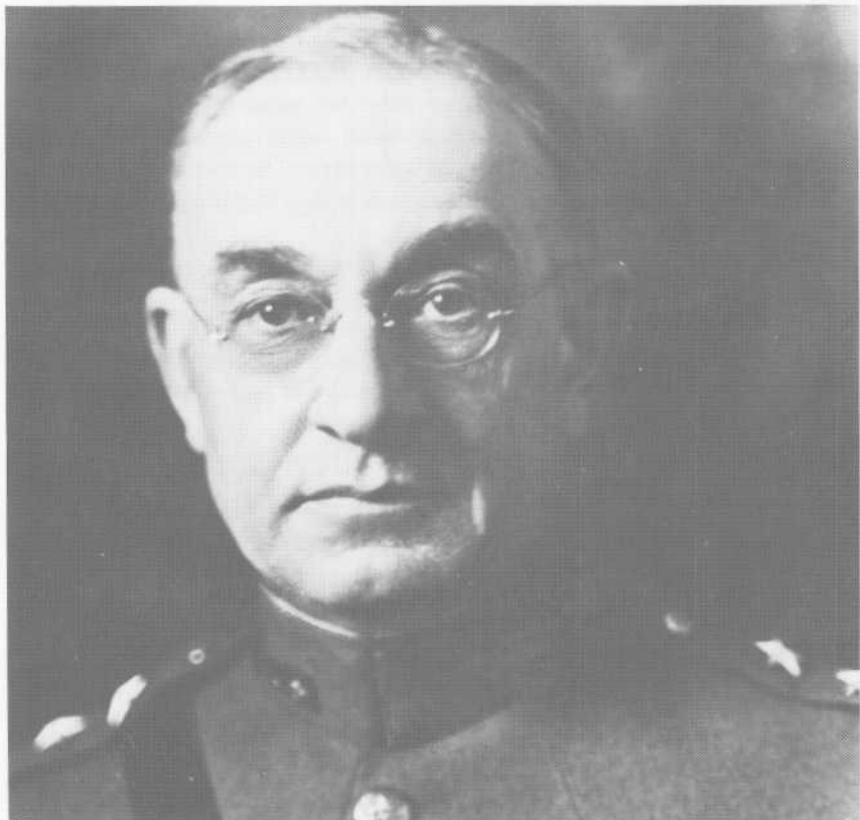
The Oil Pollution Act of 1924 directed the Secretary of War to investigate all navigable waters and nonnavigable waters connected with navigable waters.

The Chief of Engineers asked each District Engineer to confer with local or state organizations and to compile a report concerning the pollution of the District's waterways. Major Charles F. Williams of the St. Paul District reported that river pollution in his District was insufficient to interfere with navigation, commerce, or fisheries. Williams' report was seriously challenged by sportsmen in Minnesota and Wisconsin, and local politicians asked Williams to clarify his position. Williams conceded that sewage dumped into the Mississippi River at Minneapolis and St. Paul was hazardous to fish life, but he believed that Lake Pepin, 30 miles downriver, was able to purify the sewage from the Twin Cities.⁹



The outlet of the Starkey Street sewer into the Mississippi River was one of many sources of pollution in the Twin Cities area in the 1930s.

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Major General Harry Taylor. Chief of Engineers, 1924-1926.

On 4 June 1926, Chief of Engineers Harry Taylor submitted the results of the Corps investigation to Secretary of War Dwight F. Davis. Taylor classified all polluting substances into two groups: domestic sewage and industrial wastes resulting from manufacturing processes. He stated that "except in the more sparsely settled regions, the navigable waterways of the United States and their principal unnavigable tributaries are polluted to a greater or less[er] degree by domestic sewage and/or industrial wastes."¹⁰ However, he also believed that "except in isolated and unimportant instances the pollution of waters by domestic sewage and industrial wastes does not directly interfere with commerce or commercial navigation."¹¹ The Chief of Engineers reported that the pollution of the Mississippi was not serious enough to endanger or interfere with commerce, navigation, or fisheries, although Wisconsin and Minnesota were investigating the matter further.¹²

Pleasure boating seemed to be the only form of navigation seriously affected by pollution. Boaters faced offensive odors in densely populated areas. Going

beyond navigational concerns, Taylor reported that in such areas or where industrial centers were located, water pollution was disastrous to fish life. He believed that the solution to the fish problem had to be determined by each community. Taylor's analysis relied on an economic value system: The income generated by the fish industry was usually small compared to the total value of products of all other industries using the waterways. Consequently, the damage to fish habitats was indicative of a technological society that placed greater values on jobs and products of industry.¹³

Taylor believed that water pollution was not primarily a federal concern, and he advised the Secretary of War that state and local agencies were beginning to study water pollution and to take measures to control it. Some communities were experimenting with sewage treatment. Taylor recommended that the Oil Pollution Act be amended to prevent the discharge of oil from *any* source, instead of from vessels alone.¹⁴



This photograph of Harriet Island in the Mississippi River at Minneapolis-St. Paul, c. 1911, shows the river at a very low stage.

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Reduced rainfall on the upper Mississippi River basin during the early 1920s depleted reservoir and groundwater storage. In the summer of 1925 the flow of the Mississippi through Minneapolis and St. Paul was insufficient to dilute suitably the sewage and industrial wastes. Many citizens complained to the Wisconsin and Minnesota state legislatures in 1925. Each legislature appointed an interim committee to study the river conditions in the Twin Cities area as well as on the St. Croix and Mississippi rivers along the Wisconsin-Minnesota boundary line. A joint interim committee was later organized to make a separate study of the conditions of these waters. The group was funded by appropriations by the Wisconsin and Minnesota legislatures to the Minnesota Game and Fish Commission and the Wisconsin Conservation Commission, and by additional funds appropriated by the city councils of St. Paul and Minneapolis. The U.S. Public Health Service furnished supplies, equipment, and supervisory aid.¹⁵

The study concentrated on the effects of sewage and industrial wastes from Minneapolis and St. Paul. The investigation was conducted during 1926 and 1927, and covered approximately 137 miles of river from above Minneapolis to Winona. The study also investigated the possible effects of the dumping of sewage and



Harriet Island with the river at its normal level, c. 1915.

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industrial wastes from St. Paul and South St. Paul into a reservoir created by the building of a navigation dam near Hastings, Minnesota. As a result of a preliminary report submitted in January of 1927, the Minnesota legislature created the Metropolitan Drainage Commission of Minneapolis and St. Paul to investigate methods of treating Twin Cities sewage and to recommend ways of funding any necessary sewage construction. One year later, the committee submitted a second report to the state authorities.¹⁶

This second report documented evidence of Twin Cities industrial wastes and sewage that could be found for 50 or more miles downriver; fish were totally absent in the river immediately below the Twin Cities. In addition, the Twin City Lock and Dam located 6 miles below St. Anthony Falls became a pool of foul water full of urban wastes for 5 miles upstream of the dam. This was a Corps dam built in 1917; it became a major source of power for a Ford Motor Company plant. All but one of the outlets of the Minneapolis sewer system and 11 of St. Paul's sewers discharged into the river above this dam. The problem was particularly acute during summer months when river discharge was low and water temperatures were high. Aquatic growth under these conditions captured most of the oxygen needed to purify the water.¹⁷

The Minnesota River joined the Mississippi a few miles below the dam, but it did little to relieve the polluted condition. Below this point additional sewage and industrial wastes from St. Paul, South St. Paul, and Newport were added



Twin City Lock and Dam No. 1, also known as Lock and Dam No. 1, the "high" dam, or the Ford dam, is located six miles below the Falls of St. Anthony. In the late 1920s, sewage and industrial wastes from both Minneapolis and St. Paul collected in the river above the dam.

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to the Mississippi. Thirty miles south of the Twin City Lock and Dam was Hastings, Minnesota, where the aforementioned lock and dam was under construction by the Corps of Engineers. The St. Paul District Corps office had investigated the possibility of increased stream pollution above this dam. District Engineer Williams reported that "all of the cities and towns located on the Mississippi River from Minneapolis to Hastings now empty their untreated sewage into the Mississippi River."¹⁸ Thus, the river already had a pollution problem that would increase with a new dam at Hastings. In spite of this obvious conclusion, Williams reported that the cities and commercial interests of the area believed that navigational improvements were of primary importance. He speculated that these towns and cities were prepared to take care of any problems that might arise due to the dam, including the building of public sewage treatment works.¹⁹ Public works would solve both navigation and pollution problems.

The tone of the joint interim committee report was less optimistic. It stated that construction of a dam at Hastings would create a stagnant pool extending upstream all the way to the Twin City Lock and Dam. The report noted that although the relatively clear St. Croix River improved the condition of the Mississippi, pollution was still very evident in the next 30 miles downstream. At that point, the river entered Lake Pepin, which served as a settling basin. Much of the sewage that entered the lake settled on the bottom, and when the Mississippi left the lake, it was much cleaner. This was especially true when the water was high. During low water, the deposits in the bottom of Lake Pepin reduced the oxygen contents of the water, "causing nuisances" and serious fish losses. South of Lake Pepin the Mississippi again received large amounts of sewage, this time from Wabasha, Fountain City, Winona, and La Crosse.²⁰

In conclusion, the investigation revealed that from Minneapolis to the junction of the St. Croix River, the Mississippi was an unfit water supply source and was potentially dangerous to people and wildlife. "Nuisances are frequent and fish life has been practically exterminated in this zone." While the Mississippi between the St. Croix and La Crosse was better, it was still unfit for use as a water supply source.²¹

The 1920s were a period when the recreational interests on the upper Mississippi began to form into political interest groups. These organizations of sportsmen and women pushed for the preservation of a fish and wildlife refuge on the most scenic portion of the upper Mississippi between La Crosse, Wisconsin, and Rock Island, Illinois. During this same period the increased transportation of petroleum aroused national concern over potentially damaging oil spills in navigable waters. The Corps was asked to complete a survey on oil pollution. When a part of this national study was completed on the upper Mississippi River, groups interested in fish and wildlife questioned the larger problem of pollution that came from municipal sewage deposits. Consequently, additional studies were made that showed the negative effects of domestic and industrial pollution on fish habitat. In 1928 the Corps began to build a dam at Hastings, Minnesota, the first in a series of dams that would enlarge the Mississippi River channel to

a nine-foot depth. The Hastings dam, which is downriver from Minneapolis and St. Paul, was studied for its effect on water quality. The study demonstrated once again that the environmental interests along the river were at odds with the commercial objectives of urban business groups, who wished to use the river to dump untreated sewage, as well as a route to increase the transport of goods. At the beginning of the decade, the American School of Wildlife at McGregor, Iowa, lobbied for preservation of river refuges; at the end of the decade, the same group formed a nucleus of opposition against the development of the nine-foot channel, which would be a focus of government action in the 1930s.

VI

COMMERCIAL WATERS: THE NINE-FOOT CHANNEL

In 1907, Congress authorized the Corps of Engineers to maintain a six-foot channel on the Mississippi River from the Missouri River to St. Paul. By the 1920s, many people thought that the six-foot channel project was a mistake. Not only did the six-foot channel require constant dredging, but it could not accommodate the larger and heavier loaded boats. Barges that operated on the lower Mississippi had to be unloaded and reloaded at St. Louis or Cairo at a tremendous cost. As the volume of commercial traffic lessened on the upper Mississippi, there was a growing demand for a better navigation route that would allow the use of large tugs and tows to revive river transportation. One study showed that a nine-foot channel could carry 50 times as much tonnage as a six-foot one.¹ Actually, when the nine-foot channel was completed, the tonnage increased 120-fold between 1930 and 1974.

Supporters of a nine-foot upper Mississippi channel reasoned that the recent completion of the Panama Canal put the landlocked Midwest at a serious disadvantage compared to other sections of the country. The intercoastal rate through the Panama Canal was cheaper than the railroad rate from the Midwest to the coasts. As rail rates increased, strong support grew to restore pre-Panama Canal conditions by building a nine-foot channel. In 1925, the Interstate Commerce Commission increased rail rates from St. Paul to St. Louis from \$.63 to \$1.25. Secretary of Commerce Herbert Hoover addressed this problem in a speech at Chicago in 1926. He calculated that since the Panama Canal had been built, New York was \$2.24 closer to the Pacific coast while midwestern cities had moved \$3.36 farther from western markets.²

The 1927 Rivers and Harbors Act authorized a survey of the Mississippi between the Missouri River and Minneapolis, "with a view of securing a channel depth of nine feet at low water with suitable widths." The project called for a number of locks and dams that would increase navigation on the upper river channel.³ A similar project was already under construction on the Ohio River. The nine-foot channel project on the Ohio was authorized in 1910 and completed in October 1929. It was dedicated by President Herbert Hoover and viewed as a prototype project to test public investment in the growth and development of

commercial and industrial activity in the Ohio River valley. During the early 1930s the Ohio project failed to live up to expectations, but traffic gradually increased during the latter part of the decade.

Commercial interests along the Mississippi, including manufacturers, real estate developers, agricultural shippers, and others concerned with river transportation voiced regret over the lack of barge traffic. Some, however, thought that the great expense involved would be unjustified. Still others worried that the water in the reservoirs created by the locks and dams would become stagnant and polluted, harming fish and wildlife. The Upper Mississippi River Wildlife and Fish Refuge, authorized in 1924, owned most of the bottom lands between Lake Pepin and the Wisconsin River by 1930. In 1929 Henry B. Ward, president of the Izaak Walton League, expressed his concern to President Herbert Hoover and Major General Edgar Jadwin, Chief of Engineers, that the refuge would be destroyed by the nine-foot channel.⁴

Major Charles L. Hall, District Engineer at Rock Island and a recognized opponent of the nine-foot channel, reported that the nine-foot channel was not economically feasible. In addition to documenting the lack of barge traffic on the upper Mississippi, Major Hall declared that the nine-foot channel project would greatly change the flora and fauna of the region, and the slackwater pools would create silting problems. Having addressed the Wild Life School at McGregor, Iowa, he was associated with that conservation group. Hall's concern with wildlife raised the ire of nine-foot channel promoters, some of whom felt that he was compromising his role as a government engineer.⁵

The strongest supporters of the nine-foot channel came from the state of Minnesota. Wisconsin and Missouri congressmen were silent, but opposition came from Iowa, the home of the conservation movement on the upper Mississippi. Senator Henrik Shipstead of Minnesota carried the battle for the nine-foot channel through three administrations, ten sessions of Congress, and dozens of committee meetings. In March of 1929, Shipstead and Minnesota Senator Thomas O. Schall presented Congress with a memorial from the Minnesota legislature. The document advocated the nine-foot channel project and asked for the dismissal of Major Hall, who "has overridden the protests of the Mississippi Valley Shippers Association and of shippers generally throughout the Northwest, and has recommended to the Secretary of War in opposition to the establishment of a nine-foot channel on the upper Mississippi River." The memorial stressed the fact that increased railroad rates and the operation of the Panama Canal had in effect moved the Midwest farther from the seaboard.⁶

In 1929 the preliminary report of the special Board of Engineers concerning the upper Mississippi was completed. The board reported that a nine-foot channel on the upper Mississippi River was feasible, and that "reliable and economical navigation is not practicable on a depth of less than six feet but would be assured by a depth of nine feet." Additional support came from President Hoover, who reiterated his belief in water transportation. In a speech at Louisville



Major Charles L. Hall. Rock Island District Engineer, 1927-1930.

Rock Island District

in 1929, he said that deeper shipping channels would put the nation's rivers back "as great arteries of commerce after half a century of paralysis."⁷

Although the final survey report of the upper Mississippi was not submitted to the Chief of Engineers until late in 1931, Senator Shipstead succeeded in putting an authorization for the nine-foot channel into the 1930 Rivers and Harbors Act. The bill, which passed on 3 July 1930, provided for an upper Mississippi channel depth of nine feet at low water, "with widths suitable for long-haul, common-carrier service." Consequently, the upper Mississippi became a canalized river without the completed report on the project's economic and environmental ramifications.

The Corps of Engineers' final report noted many of the adverse effects of the nine-foot project. The most obvious environmental and economic changes involved the many municipal systems discharging sewage into the river. The Board of Engineers noted that the "discharge of untreated sewage into the river now affects adversely the problem of general sanitation, and specifically, water supply,

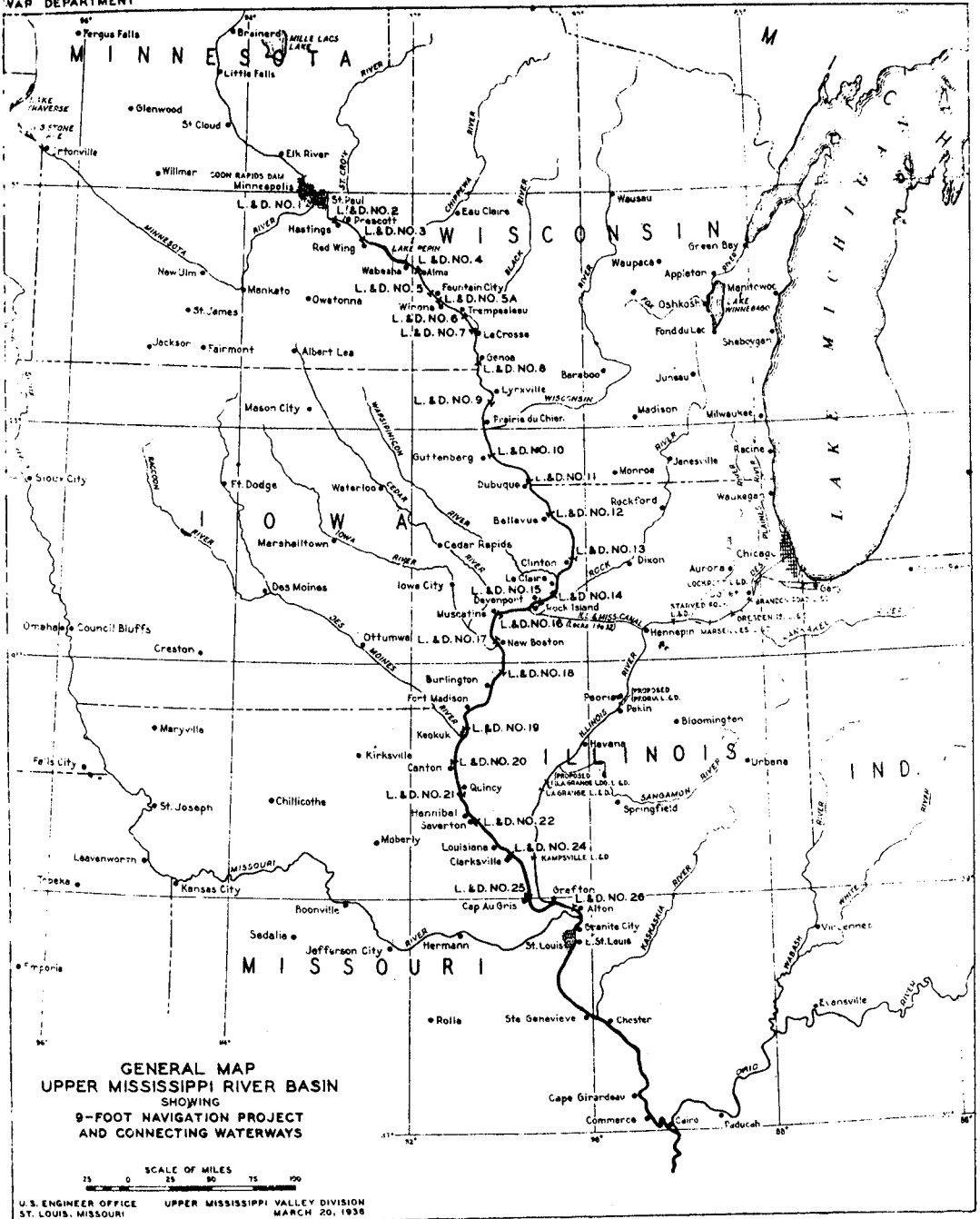
the harvesting of ice, the use of the river for recreation and particularly for bathing and fish life at points where pollution is severe.”⁸ Consequently, many remedial works would have to be built. The new reservoirs created by the 26 locks and dams threatened the water supply of many towns and cities along the main channel.

The Corps report incorporated the results of a Bureau of Fisheries survey of Lake Keokuk and other areas of the upper Mississippi. The Lake Keokuk survey determined changes in water quality and fish life after the nine-foot channel was completed. Major Hall provided a Corps of Engineers quarterboat for the Bureau of Fisheries during this investigation.

A large part of the survey centered on the physical, chemical, and biological conditions affecting fish in Lake Keokuk, where a dam built by the Hamilton Water Power Company was already in operation. The hydroelectric dam obstructed the movement of water, which resulted in a great deal of silting-in on the bottom of the lake and thus produced secondary changes. The team found a scarcity of plankton (the basic food for young fish) in Lake Keokuk, the result of closing sloughs and isolating the main channel. In many areas they found silt more than six feet deep on the lake bottom. The increased depth of the water and the silt bottom created a huge oxygen demand, especially as the silt contained sewage and other organic materials. Fauna found on the lake bottom was completely different from fauna found in nonsilted areas. It consisted of organisms tolerant of low-oxygen conditions, “which have come to be regarded as indices of a polluted or biologically unfavorable body of water.”⁹

The Bureau of Fisheries also inspected Lake Pepin and parts of the Upper Mississippi River Wildlife and Fish Refuge near Wabasha, where water levels would be raised by the nine-foot channel. There the erosion and silting-in problems were much the same as at Lake Keokuk. A sandbar impounding water in Lake Pepin produced water quality conditions similar to those in Lake Keokuk. However, both Lake Pepin and the Wabasha area included more backwaters and shallow shore water that produced plankton and supplied refuge for young fish.¹⁰ In conclusion, the Fisheries study stated that the construction of dams was not incompatible with fish interests so long as the fixed water-level type were used. The team recommended efforts to prevent the tremendous amount of silt and sewage from entering the river. An earlier study in 1922 by Professor Arthur Pearse, a University of Wisconsin biologist, reached the same conclusions. Pearse found that the decline in spoonbill and sturgeon in Lake Pepin could be attributed to “overfishing, the introduction of carp, the pollution of the river by industrial wastes, and the construction of the dams.”¹¹

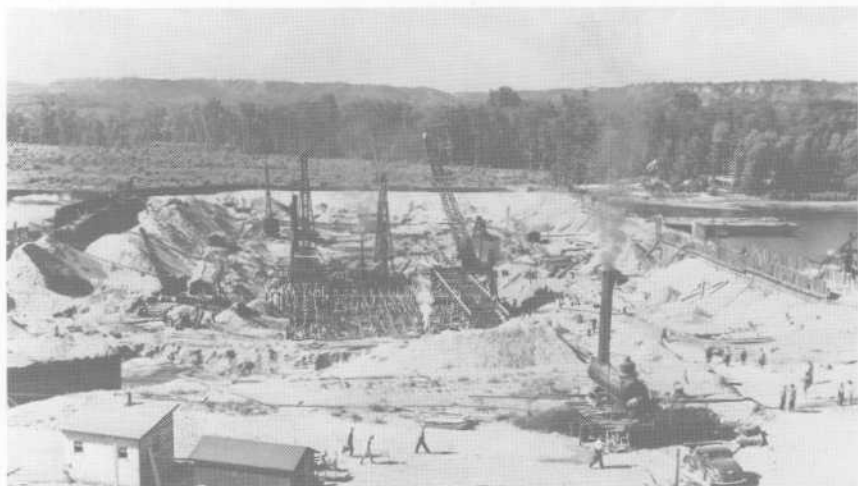
From the beginning of the work on the nine-foot channel, the Corps cooperated with other agencies and organizations to minimize the adverse effects of the dams. The project marked a turning point in Corps policy. At the request of both the Bureau of Fisheries and the Bureau of Biological Survey, the Corps of Engineers modified the designs for the new dams to benefit fish and wildlife. For example, the pool above Lock and Dam No. 6, a part of the Upper Mississippi Refuge, was planned to be maintained throughout the winter.



This 1936 map of the nine-foot navigation project shows the location of the 26 locks and dams.

Actual construction on the new locks and dams began in 1930 and continued until 1935, using funds appropriated for the relief of the unemployed. Finally, the Rivers and Harbors Act of 1935 appropriated the entire sum required for the completion of the project, despite the opposition of individuals such as Representative Frederick Biermann of Iowa. He cited reports that a nine-foot channel was not economically feasible. Quoting from a Mississippi Valley Committee report of 1 October 1934, the congressman claimed that shippers would save

\$7 million per year, while the project would cost the federal government \$8 million per year. Biermann offered an amendment to the House to stop further expenditures on "the criminal folly called the Upper Mississippi nine-foot channel."¹² Every year from 1933 to 1936 Biermann introduced legislation to stop the nine-foot channel project.

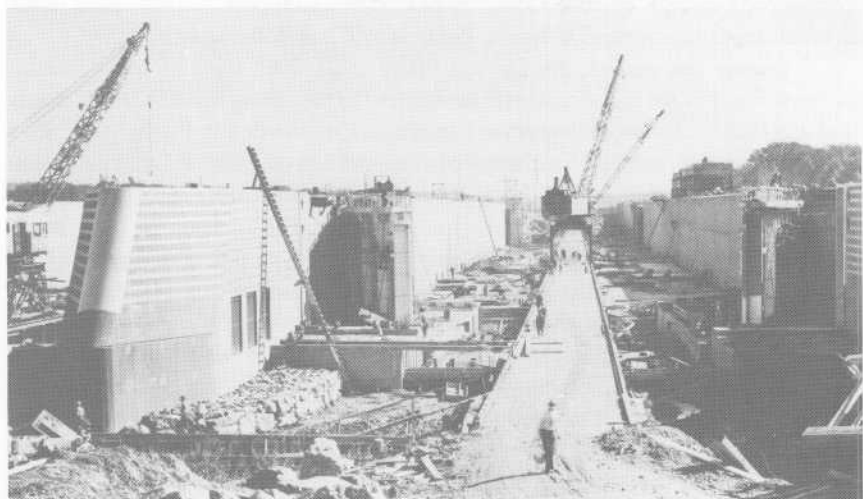


Lock and Dam No. 3 at Red Wing, Minnesota, under construction. With a coffer dam protecting the site, workmen dig and set foundations for the new structure.

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Part of the Corps plan was eliminated in the final construction. The original design called for a 140-mile extension of the nine-foot channel to Brainerd, Minnesota. Congress approved this enlargement plan both in 1934 and 1937, however, in 1938 the War Department Civil Appropriations Act cut off all funds for extending the deeper channel into the northern hinterlands of Minneapolis and St. Paul.¹³ The extension would have greatly changed the environment of the upper Mississippi. The rich iron ore of northern Minnesota could have been barged into the Twin Cities, and a midwestern steel-producing center might have been established during World War II.

By the mid-1930s the effects of the partially completed project were evident, and most environmentalists were relieved. Fish were no longer stranded during times of rapid river fluctuation, and the deeper river depth attracted many forms of wildlife. Ira Gabrielson, then chairman of the Bureau of Biological Survey, observed that the federal dams near Winona stabilized water levels, upon which waterfowl depended. The dams, "which might easily have been designed to destroy most of the wildlife value of the area," actually increased this value. Gabrielson felt that the waterfowl habitats created by the stabilized pools were a "concrete example of what advance consideration can do for wildlife in the planning of these major structures." Several years later Gabrielson wrote that the nine-foot channel project vastly improved the wildlife refuge, although many



Newly completed main lock at Lock and Dam No. 3.

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conservationists had assumed that the project would ruin the refuge. He praised the cooperation of the Corps, and declared that "it would have been impossible for any conservation organization, operating solely for the benefit of fish and wildlife, to stabilize water levels as effectively as had now been done."¹⁴ Studies by Clarence F. Culler, H.R. Crohurst, and Max M. Ellis reinforced the opinions of Gabrielson.¹⁵

Another major controversy centered on the actual operation of the locks and dams. During the winter, after the navigation season ended, the Corps would drop the levels of the pools, sometimes as much as seven feet. This action allowed ice to pass through the locks and reduced damage to the gates. Conservationists and sportsmen opposed this drawdown policy, for it reduced wildlife habitats and increased the chances for winter fishkill. As a result, the Upper Mississippi River Conservation Committee was formed in 1943. The commission was made up of representatives from Illinois, Iowa, Missouri, Wisconsin, and Minnesota; and U.S. Fish and Wildlife officials.

The height of this controversy came during World War II, when the Corps of Engineers argued that national defense and the need for shipping took precedence over all other concerns. After the war, the Corps halted the drawdown policy, but conservationists wished to establish a permanent policy of pool levels. The report of the Upper Mississippi River Conservation Committee cited the "deleterious effects" of the winter drawdown actions on fish and wildlife. The fight in Congress was led by August Andresen of Minnesota, who introduced a bill in 1946 to take pool level management out of Corps control. The bill was discussed by the House Merchant Marine and Fisheries Committee, a strong advocate of the Interior Department's concern with winter fishkill on the Mississippi River. Sportsmen also testified at the Senate Interstate and Foreign

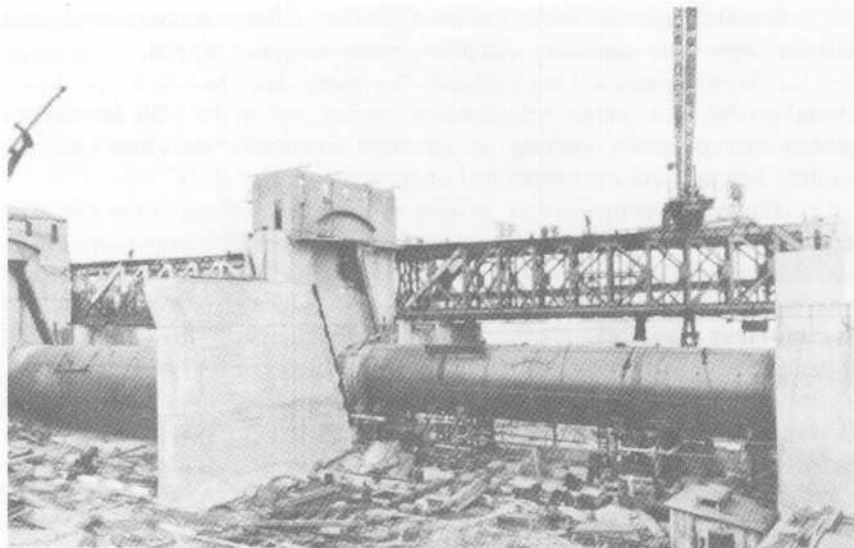
Commerce hearings. In 1948 Congress passed the Andresen measure for a stable channel depth year-round between Rock Island and Minneapolis.¹⁶

During this period, the District office at St. Paul tried to accommodate the most vocal of the anti-drawdown advocates. In the spring of 1938, the Viroqua Rod and Gun Club sent a telegram to Lieutenant Colonel Phillip Fleming, St. Paul District Engineer, asking "in interest of conservation of wildlife" that the Lynxville dam be left open until 1 June. The club feared flooding would submerge and destroy hundreds of duck nests. After Fleming agreed to keep the gates open, the club promised to send him two "nice mallards" that fall. The next year the club notified Fleming that the Biological Survey had closed so much land to hunting that they had a hard time shooting ducks, and requested the maintenance of a "decent" level of water in the winter so the fish would not be stranded when the water was lowered. Fleming replied that although the canal was operated primarily in the interest of navigation, he was "extremely interested in other factors involved," and would try "to operate the project for the benefit of them all, not inconsistent with the requirements of navigation."¹⁷ Partially to accommodate these interests, the Corps gave 150,000 acres of overflow land to the Bureau of Biological Survey in 1939 for refuge use.

In 1939 Fleming lowered the shoreward tainter gate of Lock and Dam No. 9 in response to a request by W.E. Albert, Fisheries Supervisor of the Iowa State Conservation Commission. Albert had requested that the dam be lowered because concentrations of "bruised and injured fish" were stranded above the gate and unable to swim against the strong eddy. Earlier in 1939, Fleming notified the Superintendent of Fisheries of the Wisconsin State Conservation Department that he regretted he was unable to lower pool No. 9 even one foot during February and March. Fleming explained that "variations in pool level are so strongly objected to by conservation interests that this office has decided to maintain the navigation pools in this District practically at normal operating levels throughout the entire year."¹⁸

Abel Wolman, chairman of the U.S. Water Resources Committee, cited another political problem created by the 26 new pools of highly polluted water. In 1940 he wrote to Chief of Engineers Julian Schley about health-related matters on the new navigational channel. Wolman stated that malaria had been largely eliminated in the upper Mississippi valley during the past 50 years through drainage operations, but that the completion of the nine-foot channel might cause the return of that disease. Wolman also objected to the Corps policy of keeping water levels at depths to serve only navigational interests. He charged that this policy did not aid wildlife habitats.¹⁹

The Chief of Engineers asked his District Engineers to address Wolman's concerns. St. Louis District Engineer Colonel Roy Grower reported that the incidence of malaria had not been unusually high since the opening of Lock and Dam Nos. 24 through 26, except in one county bordering Lock and Dam No. 24. He doubted that the dam was responsible. Grower also reported that the pools in his District would not be drawn down during the nonnavigation season, and



Roller gates at Dam No. 15 are in place as construction nears completion.

Rock Island District

that "every effort will be made to cooperate fully with the fish and wildlife interests."²⁰ District Engineer Colonel C.P. Gross of Rock Island reported that Wisconsin, Iowa, Minnesota, Missouri, and Illinois had initiated an "Interstate Malarial Survey" under the direction of the U.S. Public Health Service. He informed Washington that the Keokuk pool had been operating for 27 years without any claim of malaria increase, and that the city and county health officer at Hannibal reported no material increase in malaria during the past few years. Gross also noted that wildlife interests might conflict with mosquito control. Using the mosquito-control techniques of the Tennessee Valley Authority meant the spread of paris green and copper arsenite as well as the lowering of the pool depth. This factor would certainly create a conflict, as "there may be 62 cases of malaria in Iowa from several causes, but there are at least 62,000 Izaak Walton Leaguers and their sympathizers who will yell about the dead fish and our stupid and hostile behavior if we raise and lower water levels, to say nothing of the cost to provide this extra foot for navigation in contrast with the cost of quinine."²¹

In 1940, District Engineer John W. Moreland of the St. Paul office notified the Division Engineer of an investigation of mosquito-breeding conditions on the Mississippi between Wabasha and La Crosse by the State Boards of Health of Wisconsin and Minnesota. Moreland wrote that evidence indicated that most cases of malaria in Wisconsin and Minnesota were brought by outsiders, as this section of the country was at the extreme northern end of the malarial zone. He also reported that the operation of pools in his District had in general been satisfactory to fish and wildlife interests.²²

Chief of Engineers Schley informed Wolman of these findings and stressed that the Corps was cooperating with local representatives of the Fish and Wildlife Service. Wolman was still not satisfied. One month later he asked a St. Louis consultant, W.W. Horner, for his opinion. Horner replied that "the Mississippi project was apparently working out far more importantly (sic) than even the wildlife services and enthusiasts had imagined."²³

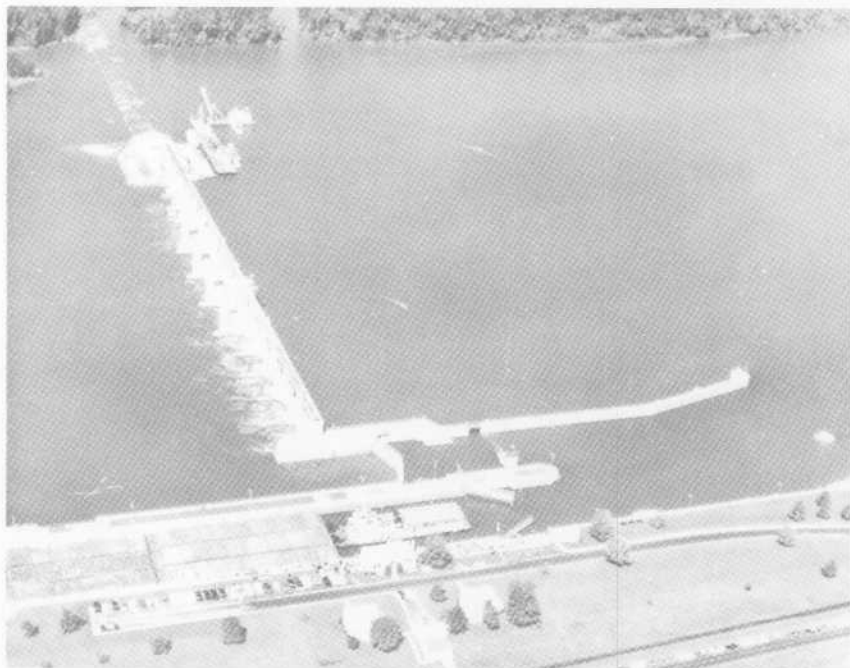
The conservationists were looking at long-range effects of the nine-foot channel project. The greatest short-range costs came from damages to sewer outlets and drainage and levee districts. For example, the filling of the pool above Lock and Dam No. 5 flooded lowlands near the town of Cochrane, Wisconsin, resulting in many damp basements and an increase in sinusitis and rheumatism. Rock Island Engineer Colonel Earl Gesler recommended that the federal government rectify all damages caused by seepage and backwater from the Corps dams. Congressman Edward Eicher of Iowa sponsored the federal legislation. The Rivers and Harbors Act of 1937 provided for compensation to drainage and levee districts. As a result, remedial works were constructed at such river towns as Cochrane, Wisconsin. At times, the reservoirs were blamed for damages unrelated to their function. During 1938 dozens of property owners along the upper Mississippi complained of crop losses due to the slackwater pools of the newly completed dams. After an investigation, the Corps concluded that most of the flooding was caused by excessive rainfall.²⁴

Complaints were not the only response to the nine-foot channel, however. Shippers and barge lines were, of course, delighted. So were the large grain companies centered in the Twin Cities. Commendatory letters also came from sportsmen and conservation groups. D.H. Janzen of the Fish and Wildlife Service observed in 1941 that conditions for fur-bearing animals and waterfowl were unquestionably better since the completion of the nine-foot channel. Eldon Saeugling, superintendent of the Federal Fish Hatchery at Guttenberg, Iowa, claimed, that fishing was better since the construction of the canal, as did Ed Volkert, a commercial fisherman at Dubuque for more than 60 years. Perhaps the most significant comments were the remarks made at the 1941 annual Conference on State Parks by Ray Steele, superintendent of the Upper Mississippi River Wildlife and Fish Refuge.²⁵

Many conservationists were alarmed and fearful of results when construction of the dams was proposed; however, studies disclose material improvement of the water, and wildlife has responded to the new conditions quite satisfactorily. We are impressed with the fact that in this instance a navigation construction project has, in fact, been of tremendous benefit to wildlife.

The main objective of the nine-foot channel was to increase the navigational use of the upper Mississippi River. No doubt this objective was achieved. During the 1920s the channel was used only to carry sand and gravel on short runs between sources of supply and local towns and cities. By the 1970s more than 60 million tons of bulk commodities were shipped on the upper Mississippi. This segment of the river was linked with the rest of the nation's inland water

transportation network. The effect on the environment of the upper Mississippi was a mixed blessing. Cities and towns were forced to build treatment plants, thus improving the quality of the water. At the same time, silting behind the dams remained a problem. Constant dredging was needed. Fish and wildlife habitats were improved, especially after the Corps was forced to terminate its drawdown policy. Just as these problems were being addressed, renewed commercial activity put greater demands on river transportation. Tows and barges grew in size, terminals were enlarged, and the 26 locks and dams became outmoded. Shippers began to push for a 12-foot channel to accommodate the increase in commercial development.



Lock and Dam No. 21 at Quincy, Illinois, showing the locks, tainter and roller gates, spillway, and levee. A barge tow squeezes through the lock in the foreground.

Rock Island District

VII

DEEPER WATERS: THE TWELVE-FOOT CHANNEL

Since the completion of the 26 locks and dams on the upper Mississippi River, the Corps of Engineers has attempted to maintain a minimum channel depth of nine feet from Cairo to the Twin Cities. A congressional resolution adopted in 1945 authorized the Corps to undertake a study of the economic and environmental feasibility of deepening the Illinois Waterway and the Mississippi River from Cairo to Grafton to a minimum of 12 feet. A second resolution, adopted in 1945, authorized the Corps to investigate the stretch of the Mississippi from Grafton to Minneapolis. In 1949 the Corps completed the first twelve-foot channel survey. The Korean War delayed congressional action on this study.¹

Congress authorized the Corps to make a new study of the twelve-foot channel in 1968. The deepening of the lower Mississippi River to 12 feet was already under way. Barge lines asked for a uniform depth on the inland waterway system. The upper Mississippi water network was out of phase with other major segments of the Mississippi River and its tributaries. Minnesota businessmen began to worry about the economic consequences of a channel that would not accommodate new and larger tows. The Corps' North Central and Lower Mississippi Valley divisions, with the assistance of interested federal, state, and local groups and agencies, initiated a Phase I study in 1968. At meetings held the previous year in Minneapolis, St. Louis, and Dubuque, railroad interests objected to a deeper channel. Conservation and recreation interests also opposed any public works that would increase traffic on the river.² Engineers agreed that a twelve-foot depth could be achieved by either raising the height of the dams or by dredging the river bottom, or by a combination of these two methods. At a meeting held in Rock Island in 1968, Rock Island District Engineer Colonel Walter C. Gelini presented four alternatives for channel development: three feet of dredging; two feet of dredging and one foot of raise; two feet of raise and one of dredging; or three feet of raise over current water levels. A Missouri game official offered a fifth alternative: "no twelve-foot channel." Colonel Gelini replied, "the twelve-foot channel is here—today or tomorrow."³

The question of a twelve-foot channel, however, was not so simple. The depth soon became a major public issue. Fish, wildlife, and recreation interests;

railroads and truck lines spoke out against the idea. The widely publicized comment of one citizen was that deepening the upper Mississippi would mean overflowing wetlands essential for the survival of waterfowl and flora and fauna, would necessitate constructing higher levees and dikes, and would possibly contribute to flooding. Calvin Fremling, a biology professor at Winona State College, claimed that although the filling in of the riverbed with sand was a natural process, the locks and dams constructed in the 1930s hastened the change. These dams caused sand to accumulate, making the riverbed rise and thereby raising the water level of the river. This, Fremling believed, meant more severe floods due to higher river crests.⁴

Twelve-foot channel opponents also stated that dredging would harm the river bottom and would require additional material disposal sites to the jeopardy of fish and wildlife habitats and aesthetic values. A preliminary study of a 32-mile stretch of river in the pool above Cap au Gris, Missouri, revealed that the Corps had to dredge 740,000 cubic yards of sand and silt each year to maintain a nine-foot channel. For a twelve-foot channel, the Corps estimated that 1,330,000 cubic yards would need to be dredged there.⁵



The dredge *William A. Thompson*, 1968. Boats such as this dig or pump out material from the river bottom to deepen the channel.

St. Paul District

Twelve-foot channel proponents maintained that a deeper channel would result in lower transportation costs and lower consumer costs for commodities. Spokesmen from grain, coal, and other industries claimed that the nine-foot channel was not competitive for upper Midwest farmers and manufacturers. Dean K. Johnson, Executive Secretary of the Upper Mississippi Waterway Association, said that each additional six inches of a barge's draft would permit a barge to ship an additional 110 tons of cargo at almost no extra cost. Because the lower Mississippi was 12 feet deep, shipments between the lower and upper river entailed the use of less efficient barges and the need to reload barges. The Upper

Mississippi Waterway Association strongly favored an expanded channel. They favored bigger tows and a reduction in locking time for their barges.⁶

Mack Dixon, project manager at the Corps' North Central Division, pointed out that a twelve-foot channel would not require deepening the entire river between Cairo and the Twin Cities. Some existing pools were already 12 feet deep. He estimated that approximately 20 to 25 percent of each pool's length needed attention. Opponents of the twelve-foot channel were not convinced. They stressed that the adverse effects of increased dredging or higher water levels would not be known until after the project was completed. Instead, they asked for further study of the present nine-foot channel.⁷

By 1972 the controversy was at its height. The Minnesota-Wisconsin Boundary Area Commission and Minnesota's representative on the Great Lakes Basin Committee asked for a federal study of alternatives to the proposed twelve-foot channel. Senator Gaylord Nelson of Wisconsin presented a public works bill amendment that limited further study on the twelve-foot channel to the investigation of environmental hazards and the completion of Phase I of the survey. The Izaak Walton League of America and the Upper Mississippi Conservation Committee spoke out against the deeper channel. Barge line operators and commercial users of the upper Mississippi were just as vocal in stressing the benefits of the twelve-foot channel. Dean Johnson noted that even without a twelve-foot channel, the volume of goods shipped on the upper Mississippi would increase from the present 50 million tons a year to 225 million tons by the year 2020. A deeper channel would permit barges to increase each load from 1,300 to 1,600 tons.⁸

The release of the broad-based Upper Mississippi River Comprehensive Basin Study in 1972 greatly alarmed twelve-foot channel opponents. The navigation appendix of the study, prepared by the North Central Division, argued that "increases in lock size and increases in channel depths from nine to twelve feet on the Upper Mississippi River and the Illinois Waterways System is recognized as a distinct need." The report noted that commercial traffic between Cairo and Minneapolis had increased so rapidly over the previous 20 years that future traffic needs would "require new, larger and more efficient locks and improved channels with navigation depths of twelve feet ... and possibly fifteen feet for the long-term 2020 needs." For many, this report confirmed suspicions that the Corps' current efforts to replace Lock and Dam No. 26 with a larger lock was the first step toward developing a twelve- or even a fifteen-foot channel. The original locks on the upper Mississippi were 110 feet by 600 feet, and many were structurally sound. The navigation appendix of the Comprehensive Basin Study stated that eventually these smaller locks would be uneconomical and inadequate.

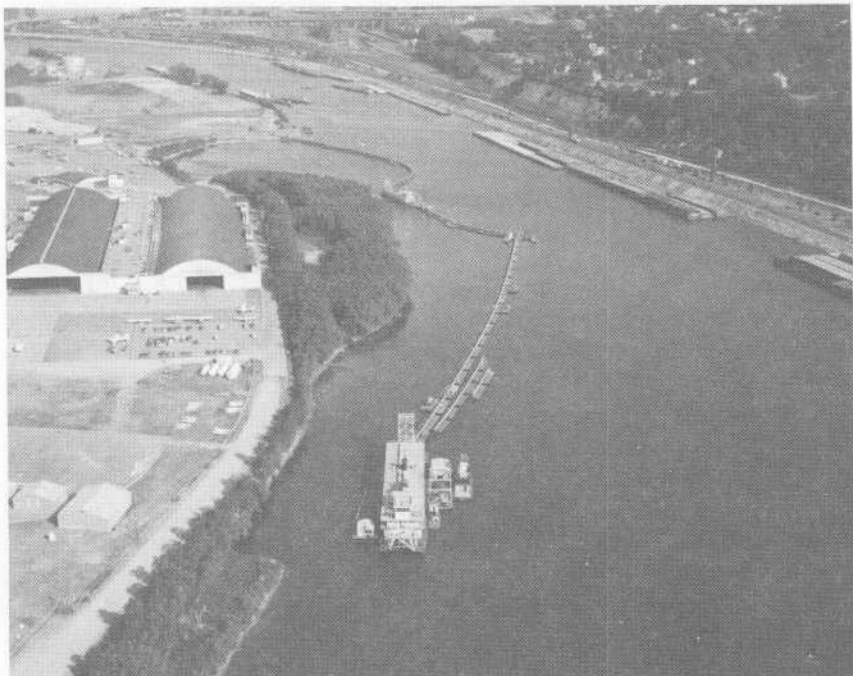
Reports in other appendices of the study revealed serious concerns about the twelve-foot channel. Most critical was the Fish and Wildlife Service's report that a twelve-foot channel would cause substantial changes in river ecology.⁹ The report pleased those opposed to the twelve-foot channel and disappointed

leased in final draft in September of 1972 (and in completed form in May of 1973). The study determined that nine-foot channel improvements and regulating procedures had resulted in a progressive loss of aquatic habitat for fish and waterfowl in some areas and an increase in the amount of "accreted" land. Even though the original locks and dams created a much larger wildlife habitat, dredging maintenance and natural sedimentation in the reservoir pools had led to degradation and deterioration of the habitat quality since the 1930s. The report expressed concern that if a twelve-foot channel were constructed such adverse conditions might develop at an accelerated rate. A twelve-foot channel would require increased dredging and additional locks.

The most important decision in the Phase I report was that a twelve-foot channel from Grafton to the Twin Cities would not be economically feasible. The Illinois Waterway from Cairo to Chicago was determined to be feasible, however. The report concluded by recommending that the twelve-foot channel study continue through Phase II, but that all studies of the area above Grafton should end. Further studies of a twelve-foot channel from Cairo to Grafton and on to Chicago have been deferred indefinitely due to the "unresolved conflicts" among environmental, navigational, and railroad interests.¹⁰

The environmental effects of dredging and silt disposal figured in the rejection of the twelve-foot channel on the upper Mississippi. Dredging involves pumping or digging materials from the river bottom. Finding an adequate site within reach of the pipes is difficult. Dredging can damage organisms on the river bottom and disposal of dredged materials can cause many adverse environmental effects. Most of the dredged material from the upper Mississippi is a nontoxic sand, which has washed into the main channel from tributary sources. The material in some cases has been stockpiled by river municipalities for use in sanding icy streets, or has been placed on beaches in recreational areas to improve swimming and sun-bathing and to restore eroded shorelines. In the past, the Corps disposed of materials pumped from the upper Mississippi in the most economical method; in open water, on wetlands, or on shoreland near the dredge site. By the 1960s environmentalists claimed that the closing off of backwaters destroyed wetlands essential to many forms of fish and wildlife. If not properly managed, dredging could also spread contaminants, reduce biological productivity, bury shoreline vegetation, and increase turbidity. Disposal sites often destroyed scenic and recreational areas. In addition, dredged material frequently ended up back in the channel, especially after floods.¹¹

Some nine million cubic yards of sand and silt were pumped annually from the upper Mississippi in the 1960s. The 1969 National Environmental Policy Act (NEPA) required all federal agencies to prepare an environmental impact statement (EIS) for any major federal action that would significantly affect the quality of the human environment. Whether the Corps' maintenance dredging operations were included was unclear. Late in 1969, members of conservation agencies in Iowa, Illinois, Missouri, Wisconsin, and Minnesota; the Bureau of Sport Fisheries and Wildlife; and the Corps of Engineers undertook a survey of the Mississippi



Dredging operations in the Mississippi River. Mud and sand from the river bottom are being pumped to an area on shore. Barges await transport on opposite bank.

St. Paul District

from Cairo, Illinois, to Hastings, Minnesota, to determine both the beneficial and adverse effects of the Corps' current dredging and disposal operations. They also investigated alternative uses of dredged material. The group's conclusion was that disposal practices were especially harmful whenever they led to the filling in of side channels, sloughs, and backwaters. These areas were extremely important to wildlife and their closure reduced suitable habitats. The team recommended a halt to disposal practices that contributed to this occurrence.¹²

In 1972 Federal Water Pollution Control Act amendments required that the Environmental Protection Agency, along with the Secretary of the Army, establish guidelines and criteria for dredged material disposal. The amendments gave the EPA the power to decide where spoil could be placed. While these guidelines were being defined, the Corps was sued over the issue. In June 1973 the state of Wisconsin asked the U.S. District Court for an injunction to keep the Corps from disposing of spoil near La Crosse. At that point dredged material was washing into a slough and threatening a fish spawning area. The state said that the Corps had not filed an EIS as required by the NEPA, and was therefore violating federal law.¹³

U.S. District Judge James Doyle issued a temporary injunction against the Corps. Soon after, he removed it stating that Wisconsin had not proved enough

damage. After gathering additional evidence, the state attorney general asked Judge Doyle for a second injunction forbidding the Corps to perform dredging operations in Wisconsin. The state cited the environmental damage in placing spoil where it could reenter the river or enter backwaters and destroy habitats. The Corps admitted that its choice of disposal sites along the upper Mississippi violated NEPA requirements. The EIS had not been filed because the Corps considered its dredging operations as regular maintenance work instead of as a new project. Furthermore, the Corps stated that if the court granted an injunction and stopped the dredging, commercial navigation on the upper Mississippi might be halted until the EIS was given final approval. Commercial users of the upper Mississippi rallied against Wisconsin's action. The Wisconsin Department of Natural Resources explained that the state was not trying to hamper navigation but was concerned with long-term effects of dredging operations.¹⁴

In March 1974, Judge Doyle granted an injunction, noting that spoil disposal in Wisconsin violated laws and caused significant environmental deterioration. The Corps was required to file an EIS on its upper Mississippi River maintenance procedures before it could deposit dredged materials in Wisconsin. The Corps filed the EIS and the injunction was lifted in April. Later, the Corps announced the policy that no new maintenance dredging would be done after 1975 until an EIS was submitted.¹⁵ While the injunction was in effect, however, the Corps was required to inform the court of any emergency dredging necessary for navigation. Under these rules the normal dredging depth of 13 feet was lowered by 1 to 2 feet, and the Corps acknowledged that commercial navigation was not impaired.

The EIS revealed that dredging and disposal operations had caused significant damage to backwaters and marshland. The statement suggested several alternatives to the existing operation and maintenance program. As a result, the Corps began selective placement disposal.¹⁶

Little time had passed before the Corps was the object of another lawsuit. The state of Minnesota brought legal action against the Corps of Engineers in March of 1975, claiming that the Corps had violated state regulations. These regulations required the secondary treatment of spoil; forbade the discharge of spoil into navigable waters, and required dredgers to obtain a permit from the state. The Corps believed that it was exempt from Minnesota's water quality standards. The Minnesota position was that the Corps had to meet their regulations just like anyone else. Both the Corps and Minnesota claimed they were responsible for regulating dredged materials placement under different sections of the 1972 Federal Water Pollution Control Act amendments. Section 402 authorized states to establish permit programs to regulate the discharge of pollutants into navigable waters. Dredge spoil is defined as a pollutant under state and federal law. Section 404 gave the Corps the authority to issue permits for spoil disposal at specified sites. The District Court ruled in favor of Minnesota in October 1975 on the grounds that section 404 applied only if a state had no approved permit program or if its permit program did not regulate dredging. The court also ruled



Stockpiling dredged material in St. Paul, Minnesota, for future use as fill for recreational or industrial land, for creation of marshes, or even for sanding icy city streets.
St. Paul District

that requiring the Corps to follow state regulations would not impair its authority to maintain navigation. The Corps appealed this decision in June 1976, and four months later the U.S. Circuit Court of Appeals reversed the District Court decision.¹⁷ For some this case appeared to be more of a power struggle than an environmental issue. It did reverse a 100-year policy of close cooperation between the Corps office in St. Paul and Minnesota politicians.

As a result of the Wisconsin and Minnesota lawsuits, the Clean Water Act of 1977 included a condition (section 404t) requiring all federal agencies to comply with state or interstate regulations controlling the disposal of dredge or fill materials. Thus, state regulations control the final selection of sites and the type of placement, and states bear a major responsibility in the control of water pollution.¹⁸

With the new legislation and court decisions, the Corps' cost for maintaining the nine-foot channel increased substantially. New methods of operation demanded larger crews and more equipment. In an attempt to adjust to these new conditions, the Corps sought help from the Waterways Experiment Station at Vicksburg, Mississippi. The Dredged Materials Research Program (DMRP), a \$30-million, five-year comprehensive research project was developed to determine the characteristics of dredge spoil, alternative methods for its disposal, and potential uses for dredged materials. Possible uses included the creation of marshes and wildlife habitats, and the filling in of recreational or industrial lands. Experts

from science, government, industry, and academia recommended future dredging projects to the Corps in 1978.¹⁹

The Great River Environmental Action Team (GREAT), established in 1974 under the direction of the Upper Mississippi River Basin Commission, was an even more ambitious undertaking. This federal-state task force was organized to develop a long-range management strategy for the multi-purpose use of the upper Mississippi. Several federal and state agencies cooperated to develop the best possible river resource management. The entire stretch of the upper Mississippi from the Twin Cities to Cairo is under study.²⁰

Dredging and dredge disposal were considered in both the GREAT and DMRP studies, and their findings changed Corps policy. One important result was that the Corps began reduced-depth dredging in 1975. Instead of dredging the upper Mississippi to 13 feet (to compensate for subsequent shoaling and channel filling), the Corps began to dredge to just 11 or 12 feet in some areas of the channel. Reduced-depth dredging cut dredging quantities in the first four years of the experiment by approximately 35 percent. Because of restraints on funding and equipment, the Corps now chooses placement sites very carefully, evaluating each site prior to disposal. Except in an emergency, the Corps obtains permission from state agencies before placing dredged material, if required by state law. The Corps monitors water quality, and is searching for beneficial and economical alternative uses for dredged spoil, such as for sand beaches and wildlife habitats.²¹

The twelve-foot channel studies and the environmental movement of the 1960s modified significantly the public works policy of the Corps. By the end of the 1970s journalists were reporting that the Corps had "shifted gears" and was one of the federal agencies taking seriously the need for public involvement in decision making.²² But the concern with navigation on the main channel of the Mississippi was not the only focus of Corps water resource management after World War II. Flood control projects were the biggest addition to Corps responsibility.



A recreational beach created with dredged material.

VIII

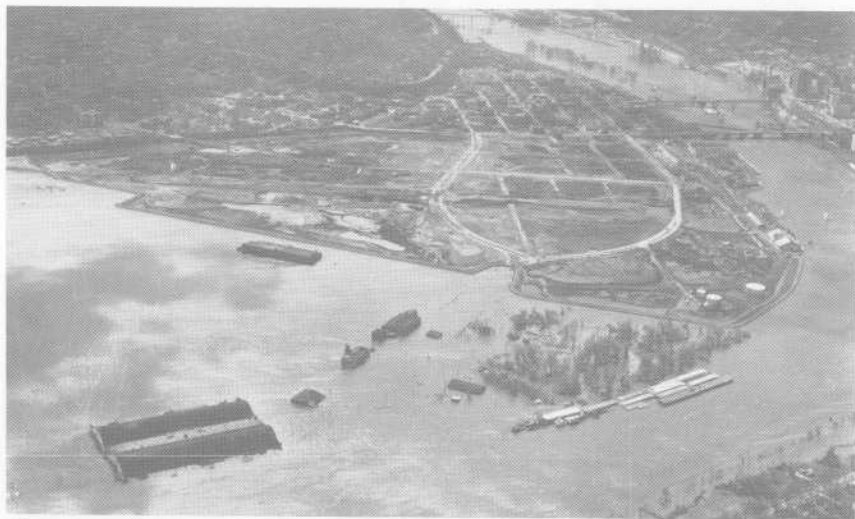
RUNAWAY WATERS: THE FLOODED CHANNEL

Since 1950, the St. Paul District Corps of Engineers has undertaken a large number of new flood control projects. The public has strongly supported some of these projects while others have resulted in controversial court fights. This chapter describes three major flood control projects: the industrial floodplain at St. Paul, the La Farge dam on the Kickapoo River, and the relocation at Prairie du Chien.

The urban flood control project at St. Paul is among the most successful public works improvements on the upper Mississippi. One of the principal industrial areas of St. Paul is located on a floodplain just south of the business section. To protect this vulnerable area of the city from flooding by the Mississippi, the 1958 Flood Control Act authorized the construction of a flood control project along the west bank of the river. Levees, floodwalls, and interior-drainage facilities were designed for St. Paul. At South St. Paul the existing flood barrier was to be raised and extended, with additional facilities for interior-drainage provided. The worst flood on record in the area had occurred in 1952, and the improvements were to protect against a peak flood discharge of 168,000 cubic feet per second, well in excess of the 1952 reading.¹ The project was designed to do more than protect existing property. The city of St. Paul wanted to create a new industrial park on this floodplain.

The St. Paul Port Authority purchased all of the property east of Robert Street to provide land for the 315-acre "Riverview" Industrial Park. The St. Paul Housing and Redevelopment Authority made similar improvements in the project area on the west side of Robert Street. Altogether, the flood barrier was built to extend approximately three miles. It was an earth levee with one-half mile of concrete floodwall. The flood barrier at South St. Paul added approximately 2.5 miles of flood barrier. The Corps completed the project in 1964.²

One year later a disastrous and record-setting flood hit St. Paul. The Mississippi crested at 171,000 cubic feet per second (cfs), 3,000 cfs over the project's design limits and 12 feet above flood stage. However, the levees, floodwalls, and a three-foot free board contained the flood, although extensive seepage occurred on the left bank of the river opposite the flood control project. The Corps'



Flooding of the St. Paul industrial floodplain in 1965. Levees are visible at the water's edge. Note supports for new bridge at far right center.

St. Paul District



The St. Paul industrial floodplain in 1981. The "new" bridge is at far right. The levees and floodwalls are visible along the river.

St. Paul District

project was credited with preventing approximately \$10 million in damages to the industrial area on the right bank of the river. The city's emergency levees built during the flood prevented another \$7.8 million in destruction. After the 1965 flood, the Corps made new additions to the South St. Paul project, thus providing a barrier approximately two feet higher than the St. Paul project. Another massive flood, which reached 156,000 cfs, occurred in 1969. This time the flood control project prevented an estimated \$15 million in damages.³

The industrial and commercial development of the protected area accelerated after completion of the flood control project. By 1978 the project protected new investments of more than \$41 million. The new industrial plants in the protected area employed more than 3,000 people and paid yearly taxes in excess of \$1 million. Despite the acknowledged success of the flood barrier, as a result of the severe flooding in 1965 and 1969 and the rapid development of the protected area, the city asked the Corps to reevaluate the project. St. Paul wished to increase the floodwalls to the same level as the Corps built in South St. Paul.⁴

The St. Paul District's preliminary study in 1978 developed three alternatives for more investigation: (1) no action, (2) flood insurance and floodplain regulation, and (3) raising the flood barrier. The study recommended further research to determine the environmental effects of the alternatives. The involved area has more than a one percent chance of being flooded; consequently, concern remains about possible development of the remaining land in the former floodplain. The St. Paul District is authorized to review the project, and further studies are pending.⁵ The Corps project, however, has contributed to the industrial growth of St. Paul and South St. Paul.

A much more controversial flood control project was started by the Corps in the Kickapoo River valley. The Kickapoo is a tributary of the Wisconsin River in southwest Wisconsin. Nine communities with populations of 100 to 700 are located along the river. Portions of these villages have been inundated periodically by recurring floods, along with thousands of acres of croplands. The Corps first studied the valley's flood problems in the 1930s, but it was not until 1962 that the Corps submitted its final report. The document recommended the construction of a "multiple purpose reservoir above La Farge for flood control, fish and wildlife conservation, general recreation, and a reduction in the deposition of sediment in the main channel and the floodplain downstream from the reservoir." Levees and channel improvements at two downriver communities were also included in the plan. Corps recommendations were approved by all federal, state, and local interests, and the 1962 Flood Control Act authorized the project. Funds for preliminary drawings were appropriated in 1964, and land acquisition began four years later.⁶

The original plan provided for a dam 70 feet high, creating an 800-acre lake at a cost of about \$12 million. However, in 1967 the Corps announced an expanded project that included a dam approximately 4,000 feet long and 100 feet high, providing a 33,000 acre-feet recreation lake with an additional flood control storage capacity of 91,000 acre-feet. About 8,000 acres of land were required



The La Farge lake and dam under construction in June 1973. The Corps stopped construction in April 1975 because of opposition from environmental groups and Wisconsin state officials.

St. Paul District

the reservoir would "not deliver the recreational, economic, and flood control benefits I believed, and most citizens believed, existed in 1971."¹⁰

The Corps stopped all work on the project in April 1975. The dam and lake were approximately 36 percent complete at that time, and 90 percent of the land acquisitions had been made. Approximately \$14.8 million had gone into the project. To most Kickapoo valley residents, the construction halt was tragic; they felt that they needed flood protection as early as possible and hoped that increased tourism would help boost the incomes of one of the most depressed areas in the state. Yet opponents of the dam felt that the Corps had overstated the recreational benefits of the project, had ignored the water quality problems, and had failed to prove that the tributaries below the La Farge dam would not continue to flood downstream communities.¹¹ When the Corps proposed a four-month study of the dry dam proposal, the Sierra Club, Senator Nelson, and many others opposed the idea, asking instead for an in-depth study of all alternatives.¹²

Even though Wisconsin Senator William Proxmire had supported the La Farge dam project, in 1975 he also asked for a halt to construction because of its ever-increasing costs. This was a crucial point in the La Farge controversy, as Proxmire was a member of the Senate Public Works Appropriations Committee. The residents of La Farge made an effigy of Proxmire and conducted a mock funeral service in response to Proxmire's change of mind. Proxmire also opposed creating a national park out of the acquired project land, which was one of Senator

Nelson's suggestions. Proxmire joined some area residents who wished to put the land back on the tax rolls if it was not going to provide economic growth.¹³

Congress voted down construction funds for La Farge in 1976. In January 1976 a Wisconsin congressional delegation asked the Corps to review flood control alternatives for the Kickapoo. The Corps contracted with the URS Corporation of New York City to do the study. The URS report concluded that the dam would be marginally justified economically; it would create local economic growth but also an algae-choked lake. Their report concluded that a dry dam would provide minimal recreational benefits and major environmental problems. As a result of these findings, the Corps offered to modify its plans by creating a reservoir one-half the previously planned size. Governor Lucey responded to District Engineer Forrest T. Gay III that "an impoundment in the Kickapoo valley, whatever the elevation of the pool, presents a number of problems, including its highly eutrophic nature and the loss of important natural features." After a review of water resource projects in 1977, President Carter recommended to Congress that the La Farge dam be abandoned and that communities in the valley should receive assistance in developing nonstructural flood control measures.¹⁴

Carter reiterated his opposition to the dam project in 1979 when the new Wisconsin governor, Lee S. Dreyfus, renewed efforts to build a dry dam. Dreyfus believed that without the dam, the Kickapoo valley would become a "Wisconsin Appalachia." Several former landowners in the project area formed a group, called KLOUTS (Kickapoo Land Owners United Together), to work for the return of their land. They opposed creating a park and argued that the acquisition of their land had been for only a dam and lake. With the project abandoned by Congress, they wanted all land returned to private ownership and the tax rolls.¹⁵

A record flood in 1978 caused \$10 million damage and underscored the need for flood control in the valley. At Nelson's request, another federal-state task force study was organized. The study recommended various nonstructural alternatives for flood control, and the Corps volunteered its planning assistance. The study also created a "Council of Governments," organized by the Federal Emergency Management Agency in 1980 to help communities make their own plans concerning such issues as flood control and economic development. Yet many area villages have shown little interest in the Council of Governments.¹⁶

Senator Nelson's defeat in November 1980 again raised hopes in the valley. Governor Dreyfus and the new senator, Robert W. Kasten, Jr., both supported the construction of a dry dam on the Kickapoo. (The Corps of Engineers had recommended the deauthorization of the original project.) The future of the Kickapoo is still undecided. The editor of Madison's *Capital Times* summarized the complex issue when he wrote, "all questions about pollution of the 1,800-acre Lake La Farge should have been answered long before the first piece of property was bought and the first shovelful of earth removed."¹⁷

One of the communities, Soldiers Grove, Wisconsin, located downstream of the La Farge dam project, decided to solve its flooding problems by relocation. The village of 500 had more than 40 structures, including the whole business

section, located in the floodplain. The La Farge dam project called for construction of levees at Soldiers Grove, but termination of the project in 1975 left the village without a flood plan. A floodplain zoning ordinance had been passed by the village in 1971, which meant that future village growth was stymied. Soldiers Grove newspaper editor, Bill Becker, wrote that building a levee would "turn a dying town prone to flooding into a dying town surrounded by dikes."¹⁸

A study by the St. Paul District Corps of Engineers had dismissed the idea of relocation, but in 1975 the District reversed its position. A disastrous flood in 1978 put Soldiers Grove's main street under nearly six feet of water and convinced most residents that relocation was the only feasible solution. With Senator Proxmire's help, the community received a Department of Housing and Urban Development grant of \$900,000 later that year to help move several structures. Additional federal funding followed in 1979 and 1980. Nearly all of the homes and businesses in the floodplain will be relocated approximately one-half mile to the east. Solar power will be used whenever possible to heat newly constructed buildings. Village residents hope that the reconstructed business district and a new park in the floodplain will reverse years of economic decline.¹⁹

An equally innovative project was planned for Prairie du Chien, Wisconsin, on the main channel of the Mississippi. This community, one of the oldest towns in Wisconsin, has been under constant threat of flooding since its founding. A portion of the city is situated on St. Feriole (or Friol) Island in the Mississippi. This island and a narrow strip of low-lying land on the mainland comprise the floodplain. Severe flooding has been an annual occurrence, but the 1965 flood broke all records. High water rose several feet above the floodplain, causing one death and nearly \$2.5 million in damages. The revenues in this section of the city decreased due to lower property values. Senator Proxmire observed that "no city anywhere in the country has had such problems with floods."²⁰

After the 1965 flood, Prairie du Chien city officials asked St. Paul District to conduct a feasibility study to determine ways to reduce floods. The Corps studied several alternatives and sought the cooperation of other federal, state, and local agencies. In 1971 the Corps submitted to Congress a plan calling for a combination of several flood control measures, including the mandatory permanent evacuation from the floodplain of 128 residences and two businesses. The proposal cited the need for continued regulation of the floodplain, continued availability of floodplain insurance, and optional floodproofing for those structures located on the floodplain fringe. The estimated 1970 cost of the project was \$2.3 million, of which Prairie du Chien was responsible for 20 percent.²¹

The Corps study indicated that this project would have no significant biological impacts, as there would be no filling in of waterways and no alteration of the Mississippi through damming or channelization. Care would be taken to avoid the destruction of important historic and archaeological sites. The plan was viewed as environmentally beneficial. Several aging and deteriorating structures in the floodplain would be removed, while existing historic structures would be floodproofed and allowed to remain. The Departments of Agriculture, Interior,



A flood in Prairie du Chien in 1975.

St. Paul District

and Transportation; the Environmental Protection Agency; and the state of Wisconsin supported the plan. It was backed also by Prairie du Chien officials and the County Board of Supervisors.²²

Congress authorized the project in the 1974 Water Resources Development Act. Local responsibility included acquiring all lands, easements, and rights-of-way for buildings removed from the floodplain; and legal control over vacated lands. During the project's planning stage the Corps gave contracts to the Historic American Building Survey and the State Historical Society of Wisconsin to survey the cultural resources of the floodplain. The first project funds were awarded to the city in 1977 in the form of a HUD block grant for the relocation and renovation of low-income homes. This amount was credited toward the city's 20 percent share, which had risen by 1980 to \$960,000.²³

Information gathered from many public meetings and door-to-door surveys indicated that most floodplain residents were willing to move if the city and Corps helped them. A floodplain zoning ordinance had been passed in 1971 that qualified the town for the federal flood insurance program. But the ordinance also restricted control by floodplain residents over their private structures. Poor maintenance and recurrent floods had made many of the buildings unsafe and unsanitary. The area had a high concentration of elderly and low-income residents, who were promised equal or better housing in the relocation plan.²⁴

Some floodplain residents, however, had doubts about the relocation project, and a few even refused to consider moving. Both city and Corps officials recognized from the start that the project would be disruptive and traumatic to those uprooted from their familiar surroundings. Prairie du Chien Mayor John McPhee stated that some of the opposition to the project was due to typical reaction against "any action that makes poor people better off." Nevertheless, some floodplain residents felt they would rather tolerate occasional flooding than move. Because the area required extensive flood control measures, and because most floodplain residents favored relocation, the eventual relocation of *all* 128 residences was deemed necessary. The benefits of advisory and financial assistance that residents received by moving from the floodplain convinced most floodplain residents to cooperate; more than one-half of the eligible island homeowners volunteered for the first year of relocation in 1978.²⁵ The Corps drew up a detailed plan for relocation of the families.²⁶ By early 1981 the acquisition of properties was nearly 50 percent complete and thus far, all relocated families have volunteered to move. The scheduled completion date was fiscal year 1983.²⁷



The relocation of Prairie du Chien in 1978 — a house-by-house solution to the flooding problem.

St. Paul District

The Wisconsin senators responded much differently to the Prairie du Chien project than they had to the Kickapoo dam proposal. In 1979 Senator Nelson stated that "the Prairie du Chien plan is a tangible example that alternatives to traditional solutions are cost-effective and environmentally compatible." The benefit-cost ratio provided to Congress for the project was 1:1. Proxmire summed up the feelings of many citizens concerning the planning process:

I am delighted that the Corps of Engineers and the City of Prairie du Chien have worked closely together to develop a nonstructural alternative to the impoundment of a free-flowing river to prevent future flood losses. Because of its innovative approach, this project is one of the relatively few Federal flood control programs that has drawn absolutely no opposition from environmental groups.

This short review of only 3 of more than 200 flood control projects studied by the Corps of Engineers since World War II on the upper Mississippi River watershed shows a modified Corps policy. Floodwalls, levees, and dams are not the only solutions to alleviating the problems of high water. Some bottomlands, like those adjacent to the business section of St. Paul, are much more valuable than others. Certain communities, like Prairie du Chien, have lived with floods for more than 200 years. Others, such as La Farge and Soldiers Grove, are located in economically depressed areas. The same solution cannot be applied to each situation. The construction of public works to save floodplains means that water will move more rapidly out of one section only to cause more damage downstream.

The La Farge dam "affair" is a prime example of a federal construction project caught up in a national debate over environmental policy. It began as a traditional "structural" approach to flood control. It was enlarged to a multi-purpose flood control project in order to include recreational and regional economic development as part of its overall benefits. During the 1970s a strong national environmental movement led in part by Wisconsin media, political figures, and conservation groups focused on the problem of "structural" alternatives to flood control. Eutrophication of reservoirs behind large dams became a major issue and the La Farge project was debated in the courts and in political campaigns. Unfortunately, the local citizens of the Kickapoo valley became the victims of this discussion, which was centered in Madison, the home of the capital, the state's major media, and the university community. Prior to the debate over environmental policy, land acquisition for the project had been completed. Thus, local tax rolls never materialized. Floods continued to devastate the Kickapoo communities. An economically depressed area became more depressed as a result of the stalemated project. By the time the Corps had developed "nonstructural" alternatives for the project, inflation and high interest rates made the project too expensive to justify costs. The half-finished dam stands as a testimonial to a mid-stream change of environmental consciousness on the part of federal and state leadership.

For many years engineers have asked for comprehensive watershed plans to control the damages caused by excessive snow melts and thunderstorms. The location of reservoirs on the main tributaries to a main river is one of the main building blocks in such schemes. During the 1960s the Corps of Engineers planned to control flooding on the Mississippi by constructing a large reservoir on the St. Croix River. This project's defeat was one more phase in the transition of the public works policies of the Corps of Engineers. The former policies were modified by a new concept: the wild and scenic river.

IX

WILD AND SCENIC WATERS: THE FREE-FLOWING CHANNEL

During the 1960s, the public became increasingly concerned about the environment. Commercial and industrial encroachment on the nation's rivers and streams and the loss of pure water for recreation alarmed many residents on the upper Mississippi watershed. Early in his term, President Lyndon Johnson committed his administration to fighting water pollution and to protecting the country's natural heritage. In 1965 the Interior Department's Outdoor Recreation Resources Review Commission urged expanding the nation's outdoor recreation facilities by recommending that "certain rivers of unusual scenic, esthetic, and recreational value should be allowed to remain in their free-flowing state and natural setting without manmade alterations." The Interior Department then drafted a "wild rivers" bill to preserve parts of the dwindling number of undeveloped rivers in their natural condition. The upper St. Croix, and its 90-mile tributary in Wisconsin, the Namekagon, was one of the longest free-flowing rivers of the 22 waterways recommended for inclusion in the system.¹

The St. Croix River travels 165 miles from its source, the St. Croix Lake in northwest Wisconsin, to its junction with the Mississippi River at Prescott, Wisconsin. Since 1948 the lower 127 miles of the river have formed a border between Wisconsin and Minnesota. The Corps of Engineers became responsible for maintaining a three-foot navigation channel on the St. Croix from the mouth of the river to Taylors Falls, Minnesota (a distance of approximately 51 miles), in 1878. Later modifications resulted in the establishment of a six-foot channel from the mouth to Stillwater, Minnesota, a distance of about 24 miles. When the construction of Lock and Dam No. 3 on the Mississippi River created a new reservoir in 1938, a nine-foot channel was established on the lower end of the St. Croix. The Corps' authorization to improve the Stillwater harbor and the new nine-foot channel raised local expectations that a new industrial sector would evolve along the St. Croix valley.²

However, it was the very lack of industrial development that made the region attractive and popular to others. The forests that had vanished during the logging era reappeared throughout the valley. The heavily reforested wilderness,

punctuated by occasional marshes and clearings, provided an ideal habitat for wildlife. The fast-flowing St. Croix provided excellent fishing and canoeing, especially in the shallower waters of the upper river. The region was unspoiled and in relatively close proximity to St. Paul and Minneapolis, affording Twin Cities vacationers a recreational paradise.³

In January of 1965, Senators Walter Mondale of Minnesota and Gaylord Nelson of Wisconsin introduced a bill, designating the portion of the St. Croix between Taylors Falls and a dam near Gordon, Wisconsin, as a National Scenic Waterway. Nelson referred to the St. Croix as "the last large clean river near a major metropolitan area in all of the Midwest." Representative Joseph Karth of Minnesota submitted a similar bill in the House. The Department of the Army opposed section 8 of the St. Croix bill, which prohibited any structural changes to the river. They wished to retain their authority to "improve" certain segments of the river.⁴

One of the major reasons for Secretary of Army Ailes' position on section 8 was the Corps of Engineers' concern with the periodic flooding of several communities located on the St. Croix. Engineers had considered building flood control structures on the St. Croix in 1930 and again in 1952, but the suggestions to construct a dam were rejected. Flood control studies were put aside until 1965, when a spring flood caused extensive damage throughout the upper Mississippi River valley. Damages to the St. Croix River basin alone were an estimated \$5.5 million, approximately one-half of which occurred at Stillwater, Minnesota, and Hudson, Wisconsin. In addition, waters from the St. Croix added to the destruction downstream on the Mississippi. About 20 percent of the floodwaters came from the St. Croix watershed during this major inundation.⁵

The Corps argued that if water were impounded on the upper St. Croix, water levels could be reduced on both the lower St. Croix and the upper Mississippi. The Minnesota River basin and the Mississippi above Minneapolis were also primary sources of major Mississippi River floods. The Corps investigated all of these areas for potential reservoir storage sites in an effort to prevent the recurrence of disastrous flooding. Investigations showed, however, that storage sites on the Mississippi and its tributaries above Minneapolis were either too small or too far north to effectively reduce flood peaks below the Twin Cities. Consequently, the St. Paul District concentrated on determining the best available storage sites on the St. Croix and Minnesota rivers.⁶

In January 1966, a public hearing was held at Stillwater on a proposal to construct a flood control dam on the St. Croix at or near the site of the old Nevers logging dam. The 1965 flood focused local interest in flood control. The St. Croix *Standard Press* noted that the need for flood control "brought all factions represented at the meeting into a spirit of cooperation and common concern over a public tragedy which threatens again this year." In addition, participants learned that reservoir benefits included the creation of a large recreation lake, a deeper navigation channel upstream, better fishing, and an improved environment for wildlife.⁷

Early in 1967 more information was released. The Corps of Engineers' studies concluded that a site on the St. Croix would have a larger potential storage capacity than any tributary of the Mississippi in that area. A Corps dam and lake were the most economically feasible alternatives. This announcement touched off increasingly vehement and well-organized opposition to both the reservoir proposal and to the Corps as a dam-building organization. The Twin Cities press led the fight.

The Corps proposed a dam 1 to 8 miles upstream of Taylors Falls, Minnesota, which would turn a portion of the upper St. Croix into a 114-mile lake. This action, according to the St. Paul *Pioneer Press*, would inundate thousands of acres of wooded terrain during some seasons, and create "a muddy waste" during others. Although the dam's primary purpose was flood control, the *Pioneer Press* pointed out that possible hydroelectric installations at the dam site would result in increased industrial development. Although the Corps' reservoir studies were as yet tentative, the editor claimed that "studies always start under innocent 'tentative' labels, but there is an ominous history in many cases of unstoppable progression after preliminary headway is made." The *Pioneer Press* and others encouraged the passage of the St. Croix Scenic River bill, and suggested that the Corps of Engineers look into possible levees, dikes, and other flood control methods on the St. Croix, as well as floodplain zoning.⁸

Colonel Richard J. Hesse, the District Engineer at St. Paul, responded to the press criticism. He admitted that "one or more reservoirs could adversely affect certain natural resources" but also pointed out that the reservoir would "provide a partial solution of some of the critical water problems of the region." He stressed that the St. Croix study was only in the preliminary stages, and that it would consider values other than economic feasibility. The Corps had to adhere to federal planning and water resource development guidelines set forth in 1962. This legislation emphasized that the well being of people was to be the overriding determinant in considering water resource development. According to Colonel Hesse, information collected after the 1965 flood would provide data on how many people would benefit from the proposed project. Although admitting that alternative methods of flood control were possible, Hesse stated that the "reservoir storage is the only method that will prevent the damage and traffic interruptions on the highways and railroads in the floodplain and will reduce the flood damages in the extensive rural areas."⁹

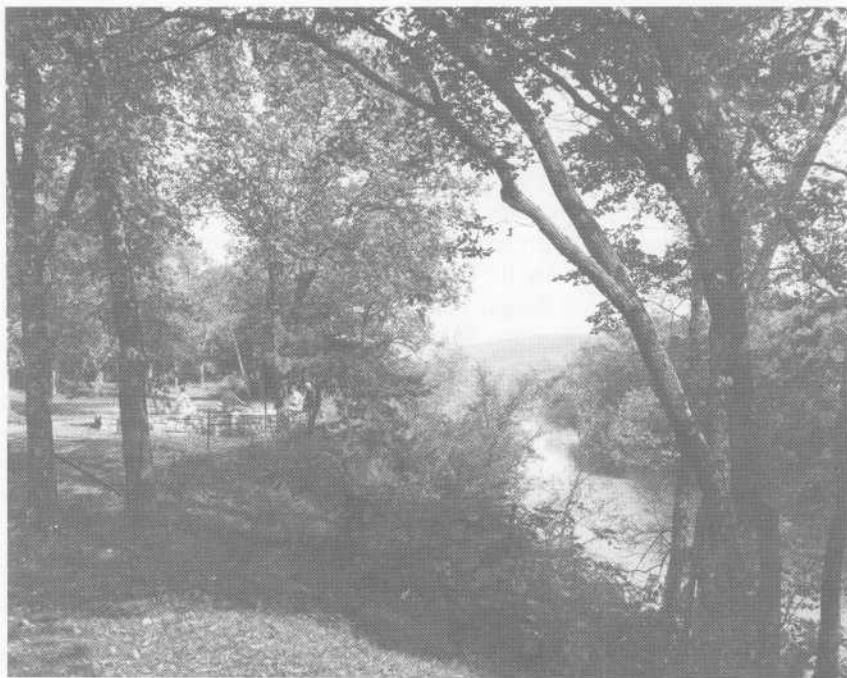
In August, at the request of Chairman Wayne N. Aspinall of the House Committee on Interior and Insular Affairs, the Department of the Army defined its position on the wild rivers bill. A Department letter explained that "the nation can well afford to forego the development of streams of unusual natural beauty," but that Congress' decision to set aside such streams must be based on a full report and plan for each river. These reports would present "wise decisions" outlining both the advantages of preserving the rivers in their natural state and the economic values that would accrue from their development. In this way, "before the Congress makes its final decision it will know what the nation would be giving up

in the form of material wealth in order to preserve the intangible benefits of an unspoiled natural area." Several months later, Wisconsin Governor Warren P. Knowles expressed apprehension over the Department's goal of informing Congress of both the economic values of river development and the "intangible" values of wild river status. Knowles believed it was "doubtful that such a comparison is possible because there is no way to properly assign comparative economic values to these intangibles of beauty, solitude, wilderness inspiration, and fish and other wildlife."¹⁰

The Corps released their completed two-and-a-half-year preliminary study of the St. Croix early in 1968. The Corps indicated that it would be economically feasible to construct a 100- to 120-foot-high dam on the St. Croix about 10 miles north of Taylors Falls. The dam would eliminate the possibility of setting aside that portion as a wild river. Approximately 40 miles of the sparsely settled upper St. Croix would be turned into a reservoir, covering 75,000 acres of land, and extending the pool over 114 square miles. The small town of Sunrise, Minnesota, would be inundated. Besides flood control for the whole upper Mississippi, additional benefits included more facilities for fishing, boating, and other recreation; hydroelectric power; surplus water that could be diverted to the Twin Cities for future water needs; and supplementary water during times of low flow on the Mississippi and lower St. Croix.¹¹

The preliminary study soon exploded into a controversial regional and even national issue. The Northern States Power Company, which owned approximately 30,000 acres of land along the St. Croix, opposed the idea of a dam as incompatible with the preservation of the river's wild characteristics. The major supplier of electricity in the area consequently joined environmental groups and concerned citizens in the campaign against the Corps' proposal. The editors of a growing number of newspapers fought for the river's preservation. The Minneapolis *Star* felt that the dam "might be practical but in our opinion it is a mistake," and reported that local support for the proposed dam had dwindled. "Major floods have not been frequent on the St. Croix and residents seem willing to risk an occasional wet basement for the privilege of enjoying the beauty of the valley." The Minneapolis *Tribune* encouraged floodplain zoning and management, and pointed out that the Corps itself admitted that the high water levels of the 1965 flood were likely to occur about once every 100 years. The Corps' response, that a reservoir capable of controlling a 100-year flood would provide complete control during all floods equal to or smaller than the 1965 flood, received little media support.¹²

Meanwhile, Minnesota and Wisconsin congressmen were urging quick congressional action for preserving the St. Croix and Namekagon. The Senate passed legislation declaring the St. Croix a scenic waterway in the 89th and 90th Congresses, but the House held up its wild rivers bill. In addition, the House bill only included the lower St. Croix! Congressman Joseph Karth of Minnesota encouraged the inclusion of the upper St. Croix and Namekagon in the wild rivers bill. He noted that under the proposed bill, "one of the most beautiful spots in



The upper St. Croix — a “wild and scenic river.”

St. Paul District

this country will be at the bottom of a 40-mile-long lake.” Senator Nelson went before a congressional committee to oppose the Corps’ dam proposal, stating that “the Corps of Engineers is like that marvelous little creature, the beaver, whose instinct tells him every fall to build a dam wherever he finds a trickle of water.”¹³

A St. Paul *Pioneer Press* editorial acknowledged Nelson’s remark, and observed that “the beaver builds for a reason, but the Army Corps boys seem to build just for the sake of building.” The *Press* then asked, “Is an expensive dam, a forever ruined wild river, and a permanent public displeasure worth it just to prevent raging waters once every 100 years?”¹⁴

Harry Carlson of the St. Paul District Basin and Project Planning Section notified the Minnesota-Wisconsin Boundary Area Commission that “the area that would be inundated is sparsely populated and of relatively low financial value.” Yet the Boundary Area Commission opposed the dam and testified before the House Committee on National Parks and Recreation for wild rivers status for the St. Croix and Namekagon. The commission declared a dam incompatible with the best and highest use of the land and water in the St. Croix valley.¹⁵

Statements in favor of the proposed dam emerged occasionally, usually in regard to the importance of controlling flood damages. The *Winona Daily News*, for example, reported that in certain cases “‘Wild Rivers’ become secondary.”¹⁶ But in spite of such statements, the Corps was clearly on the defensive. The St.

Croix dam issue portrayed the Corps as a destroyer of the environment. Such judgments lacked historical perspective. The St. Paul District had been responsible, for example, for acquiring many thousands of acres that had provided Wisconsin and Minnesota with wildlife management and recreation. Instead, the Corps was depicted as a governmental public works firm that needed new construction projects to stay in business. Few people wished to listen to an argument based on economic feasibility. Even the matters of water supply and recreation were ignored. The issue became preservation of the natural environment.

In an attempt to present the Corps' position, J. Robert Calton, St. Paul District Chief of Basin and Project Planning, discussed the benefits of the proposed dam in a speech before the St. Croix Valley Chamber of Commerce in March 1968. He emphasized that recreation facilities could be developed with much greater scope than if the St. Croix was designated a wild river. Calton cited estimates that annual revenues from reservoir visitors would exceed \$3.5 million by the year 2020. The Corps engineer admitted that wildlife within the reservoir area would be adversely affected, but pointed out that the reservoir would benefit fish habitats above and below the reservoir. The key point, however, was that "substantial flood control reservoir storage on the St. Croix River is highly desirable." Acknowledging the widespread controversy over the Corps proposal, he observed that "to plan for the future is a difficult and often thankless task."¹⁷

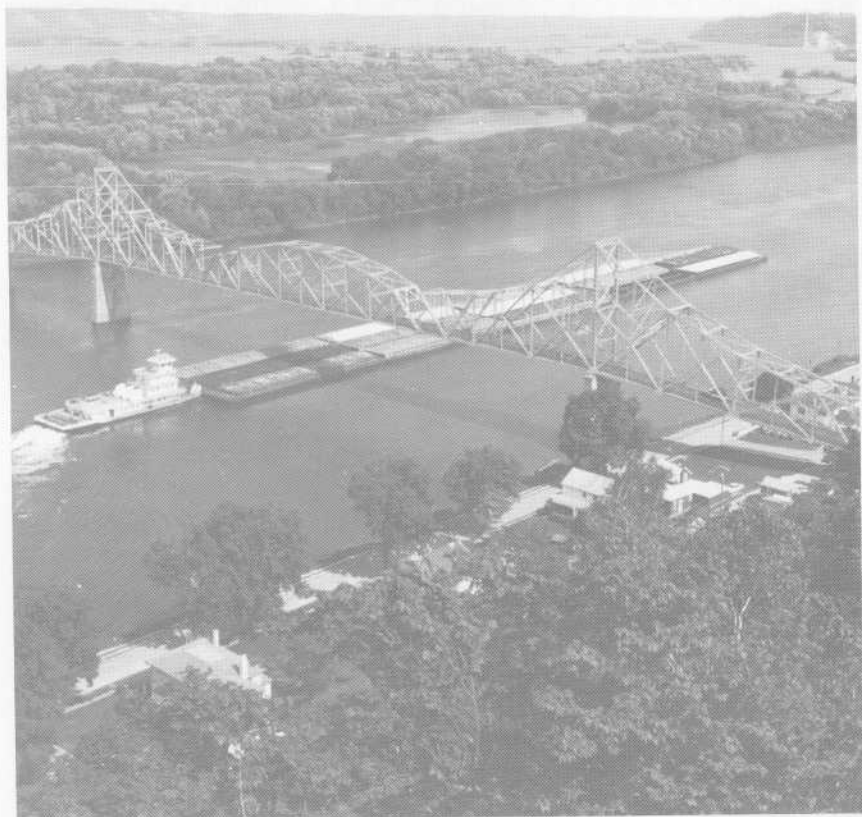
During the month of April 1968 the Twin Cities newspapers kept the issue before the public. The Minneapolis *Star* softened its approach somewhat by stating that the Corps "for all its good work, is an empire-building agency which sometimes needs its public work ambitions curtailed." The Corps of Engineers also softened its position. General William Cassidy, Chief of Engineers, advised the North Central Division Engineer that the St. Croix situation could be "a unique opportunity to demonstrate" the Corps' "capability as a competent, objective, national planner in the public interest."¹⁸ He asked for cooperation from all state, federal, and local government agencies to work out a comprehensive plan for the river. F.E. Anderson, Jr., assistant director of Civil Works for the North Central Division, proposed further studies, considering public and congressional interest in preserving the river. St. Paul District Engineer Hesse promised to develop flood-planning alternatives that would be "in the broad public interest."¹⁹

Congress, however, was not interested in more studies of the St. Croix. Senator Proxmire joined Senators Mondale and Nelson in opposing any additional funding for Corps review of the river. They insisted on immediate passage of the wild rivers bill. Wisconsin Governor Warren Knowles wrote to Colonel Hesse advocating wild river designation without delay. Representative Karth again suggested that the Corps look to floodplain management, and reported that a recent poll of his constituents had generated 14,000 responses of nine to one in favor of preserving the St. Croix.²⁰

The Northern States Power Company helped assure the inclusion of the St. Croix in the final Wild and Scenic Rivers bill. The company agreed to convey without cost approximately 70 miles along the river to the federal govern-

ment and to Wisconsin and Minnesota, if the area became part of the wild rivers project. The company also sponsored a 30-minute film, "Waters of the St. Croix," which promoted the preservation of the river in its natural state. On 2 October 1968, Congress passed the Wild and Scenic Rivers Act, preserving eight waterways "in free-flowing condition." The St. Croix River above Taylors Falls along with the entire Namekagon tributary was included. The lower St. Croix was set aside for further study and possible later addition to the wild rivers system.²¹

The Wild and Scenic Rivers Act prevented further consideration of the upper St. Croix for reservoir storage purposes. The controversy was over, leaving the Corps with a tarnished image that it was eager to forget. The public works tradition, which had been the pride of the Corps for 100 years, had been seriously challenged. Further efforts in the St. Paul District anticipated that the Corps would become a federal planning organization that respected the natural environment and worked to preserve precious natural resources. An institution that was once proud of "making the dirt fly" began a policy of hiring environmental specialists.



A tow of barges on the Mississippi River passes between the town of Lansing, Iowa, and the Upper Mississippi River Wildlife and Fish Refuge.

St. Paul District.